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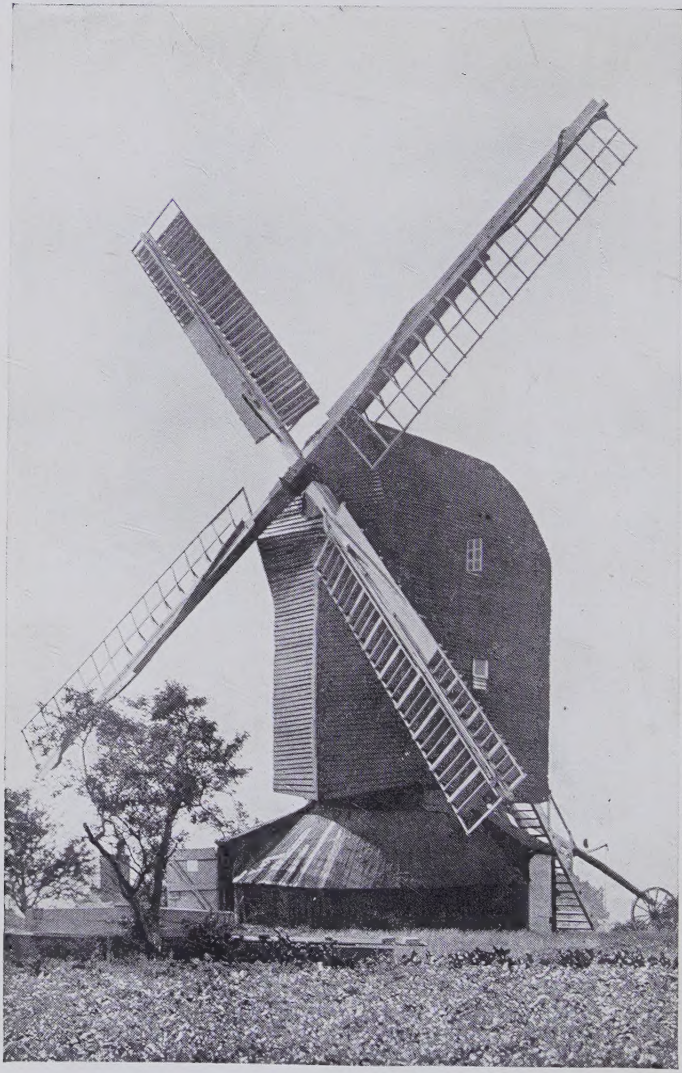

ASH MILL, KENT.

[*Photo Rev. A. H. Collins.*

ENGLISH WINDMILLS

Volume I

Containing a history of their origin and development, with records of mills in Kent, Surrey, and Sussex

By

M. I. BATTEN

on behalf of

THE SOCIETY FOR THE PROTECTION OF ANCIENT BUILDINGS

1930

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THE WINDMILL

(Reprinted from "The Poetical Works of Robert Bridges," by kind permission of the Oxford University Press)

The green corn waving in the dale,
The ripe grass waving on the hill:
I lean across the paddock pale
And gaze upon the giddy mill.

Its hurtling sails a mighty sweep
Cut thro' the air: with rushing sound
Each strikes in fury down the steep,
Rattles, and whirls in chase around.

Beside his sacks the miller stands
On high within the open door:
A book and pencil in his hands,
His grist and meal he reckoneth o'er.

His tireless merry slave the wind
Is busy with his work to-day:
From whencesoe'er, he comes to grind;
He hath a will and knows the way.

He gives the creaking sails a spin,
The circling millstones faster flee,
The shuddering timbers groan within,
And down the shoot the meal runs free.

The miller giveth him no thanks,
And doth not much his work o'erlook:
He stands beside the sacks, and ranks
The figures in his dusty book.

Robert Bridges.

FOREWORD

That windmills are becoming things of the past must be apparent to everyone. In counties where they used to flourish the majority are now derelict, and there are few working mills. Although the trade of the windmill has been of great importance to the population of England for seven centuries, scarcely any histories of them have been written. Their origin is obscure; their numbers and comings and goings have never been recorded. Realising that this for many centuries important industry was dying, the Society for the Protection of Ancient Buildings determined to make a record of all the windmills of which any trace was left in Great Britain. In the belief that the public is interested in windmills, and in the hope of increasing this interest, this information will be published from time to time as it is collected.

It will take several years to collect the information, and so far only the surveys of Kent, Surrey, Sussex, Warwickshire, and Cambridgeshire have been completed. As Kent, Surrey, and Sussex have more windmills than any other counties in the South of England, it was decided to publish in this first volume the information on these three counties, to-

gether with a short history and a brief description of the mechanism and development of windmills in England.

In this book a map is given of each county, marking the main roads, principal towns, and the approximate position of the mills. It is impossible, in a book of this size, to go into the details of the country roads and villages. In the list of mills I have mentioned the direction from the nearest big town. This, with the map, seemed to me to be the simplest and clearest way of placing them.

It is not easy to state the age of a mill. Records of their building were very rarely kept. There is also the difficulty that mills from time to time caught fire or were blown over. When this happened another mill was often erected on the same spot. In many cases the same timbers, or what remained of them, were used. Thus a date which had been carved on a beam of the old mill may have been included in the new mill. So the discovery of a date in a mill does not necessarily mean that it gives the true age of the mill. The same arguments apply to mills shown on old maps. These can only be taken to show where mills stood when the map was made. They are not proof that a mill in the position shown is as old as the map.

It is also difficult to get information about deserted windmills. Often the miller is dead, and all that

can be gathered from people living near by is either that they never remember having seen the mill work, or else that they remember it working when they were children.

Windmill terms differ in various parts of the country. In Kent and Sussex the sails are called "sweeps." In Cambridgeshire if you talk to a miller about his sweeps he will look upon you as a person completely ignorant of windmills, for he never calls them anything but "sails." In Anglesey they are called "wings," and in Yorkshire "arms." The most usual and technical term is "sails," but in this book, which deals with counties in which they are called "sweeps," I have more often used that word.

About thirty years ago Bennett and Elton published a *History of Corn Milling,* the second volume of which was devoted to "Wind and Water Mills." This book is the most correct and detailed history of windmills which has so far been published. Few people would attempt to write about windmills in any detail without reading it, and I am indebted to it for many facts. Since the date of its publication more information has been collected about windmills in different parts of the world, but it nevertheless remains the best textbook that exists.

Many people have helped me to collect information and photographs, and I thank them sincerely. Mr. Coles Finch, of Chatham, has studied the mills

of Kent all his life, and has recently visited nearly every one of them for me, so that the information given here could be up-to-date. He has taken many admirable photographs, which are reproduced in this book.

Mr. Jack Holman, of the firm of millwrights of that name established in Canterbury in 1815, has sent me many photographs and valuable information.

Mr. H. P. Vowles very kindly sent me a copy of his paper on the origin of windmills which he recently read to the Newcomen Society. Much of his argument is reproduced in this book.

To Mr. Rex Wailes, an engineer and millwright who has advised the Society in the repair of mills, I am indebted for invaluable advice and assistance whenever I have asked for it. Mr. Wailes has kindly written the second chapter of this book, "Design and Development." Because of his trade and his practical knowledge of windmills, he is as well equipped for speaking of their machinery as anyone.

I would also like to thank Mr. Raymond McGrath, who has designed the wrapper of this book; Captain J. F. Batten, who has helped me with the maps; Mr. Thurston Hopkins, who has recently published a book entitled *Old Watermills and Windmills;* Mr. E. Wishart, Mr. E. Glover, Miss Helen Lloyd, Mr. E. Sheldrick, Dr. Richardson Billings, and Mr. Druce, of the Kent Archæological Society.

Many other names pass through my mind of kind people, known and unknown, who have sent me information and photographs, and I regret that I cannot mention them all.

M. I. BATTEN.

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ENGLISH WINDMILLS

CHAPTER I

A HISTORY OF WINDMILLS

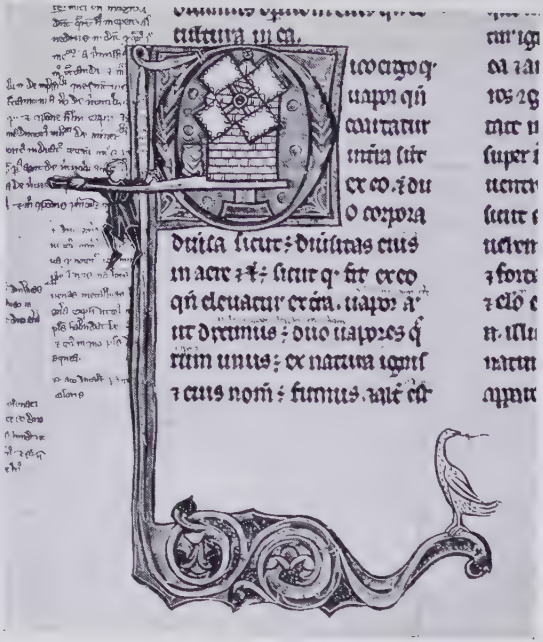
The origin of the windmill is a much debated point. Various theories are put forward, but none of them seem to have really conclusive evidence. Many people have sifted such evidence as exists. Some have come to definite conclusions, others have remained with open minds. It is only since the end of the last century that any effort has been made to discover the history of the windmill. Perhaps, some day, someone will succeed. I, personally, am not convinced about any one of the theories that exist at present, and therefore in this book take no particular side. I shall mention the three principal views, and refer, when possible, to books or papers that deal with them more fully. The century during which the first windmills were built in England can be stated with a close approach to certainty.

At one time it was thought that some of the six thousand mills mentioned in the Domesday Survey

must have been windmills. This theory has, almost certainly, been proved incorrect. Watermills, cattle mills, and hand querns are known to have existed in England and in other parts of the world for many centuries before the Norman invasion of England. But when the words "wind" and "mill" first came to be coupled together in England in the twelfth century, the mill was mentioned as though it was a new and interesting curiosity. If windmills had been working for over a century this would not have been the case. Before the twelfth century mills were sometimes described as water- and sometimes as cattle- but never as windmills. These two facts, I think, finally place the approximate date of their arrival. It is curious, also, that windmills came to be first noted in documents all over Western Europe at much the same time—that is, in the twelfth and thirteenth centuries.

The three principal theories of the origin of the windmill are: (*a*) That they were invented by the Greeks in about the first or second century A.D.; (*b*) that the Crusaders, finding them used by the Saracens, brought the idea back to Western Europe; (*c*) that they were independently invented in Western Europe. There are arguments for and against all these theories, which I will endeavour to give.

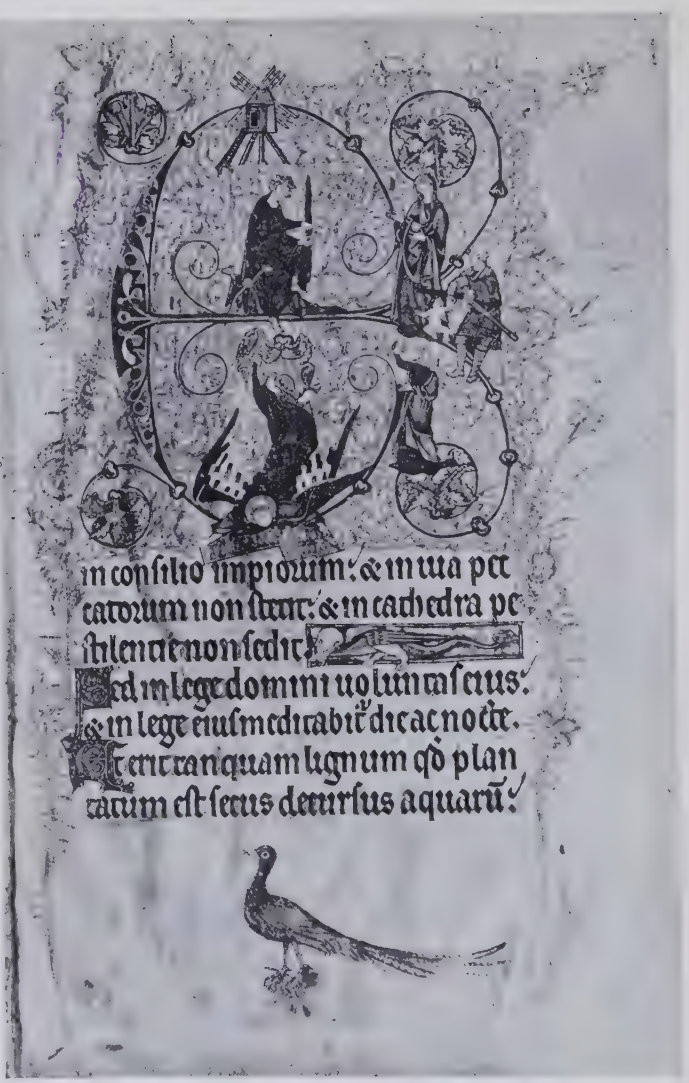
If there was a Greek windmill in the first or second century A.D., it was certainly much earlier



ARISTOTLE'S "PHYSICA," THIRTEENTH CENTURY.

LOUTERELL PSALTER, FOURTEENTH CENTURY.

[*By permission of the British Museum.*


in consilio impiorum: & in via pec
catorum non stetit: & in cathedra pe
stilentie non sedit:
Sed in lege domini voluntas eius:
& in lege eius meditabit die ac nocte.
Et erit tanquam lignum quod plan
tatum est secus decursus aquarum:

Windmill Psalter, Thirteenth Century.

[*By permission of Mr. Pierpont Morgan.*

than any suggested by either of the other two theories. In J. C. Greenwood's English translation of the *Pneumatics of Heron of Alexandria,* he heads one proposition, "An Altar Organ Blown by the Agency of a Windmill." Liddell and Scott's Greek Lexicon also mentions *ανεμούριον*, translating this word "the sails of a windmill." Mr. H. P. Vowles has examined this theory of a Greek windmill thoroughly, and recently read a paper on his deductions to the Newcomen Society. He has examined five Greek manuscripts, two Greek printed texts, and translations in Latin, Italian, German, French, and English. He argues that this word "anemourion" is always taken as meaning the "sails of a windmill," though he quotes one or two Latin translators who have been unable to make up their minds about it, and who add a footnote that it might mean either "windmill" or "windvane." He also says that as far as he can trace this word, it occurs nowhere else at that date where it could possibly be interpreted as "windmill." It appears in Strabo's *Geography,* but refers to two headlands in Cilicia, and seems to mean "windy head." An organ is an old instrument, and wind has always played the principal part in the production of sound. From the translation of the word "windy head" in the *Geography,* it seems to me that this same word when applied to the organ may have merely

meant the space, with or without vanes or sails, through which the wind was obtained.

Against this theory of a windmill existing in Græco-Roman times is the fact that Vitruvius, who lived at much the same time as Heron, has described a large number of the mechanical devices then in use. He describes watermills, water organs, hoisting machines, and other appliances of a like nature. He also discusses winds at some length. He makes particular mention of the windvane or weathercock, and refers to the production of organ sounds by wind pressure. Considering his interest in both machinery and winds, it is unlikely that if a windmill existed he would have omitted to mention the fact.

Mr. Vowles, having accepted the Greek windmill as not improbable, then develops an interesting theory. In the early centuries A.D. the Greek language and civilisation had great influence in the Near East. As Christianity spread, the Bible, and works containing the metaphysical and theological speculations of Alexandria, were translated into Syrian and Persian and travelled eastwards along the main trade routes. With these translations, Mr. Vowles suggests, went Heron's *Pneumatics* with its windmill.

Early in the tenth century al-Mas'udi, the Arab geographer, was born at Bagdad. For many years

he travelled, visiting different countries, cities, and peoples. Then he began to write, and there is little reason to doubt that his observations were correct, for many of them can be checked. His principal work, *Meadows of Gold,* has been translated into French and part of it into English. He describes the land of Seistan, in the East of Persia, as a land of continual winds and sands. He states that the inhabitants of Seistan were renowned for their industry in using the wind for turning sails. This statement is corroborated by another writer of his time, Ebn Haukal, whose *Oriental Geography* was translated into English by Sir William Ouseley more than a hundred years ago.

Colonel R. L. Kennion, who was at one time British Consul in Seistan, describes the wind (which he obviously hated) at some length; how it blew all the year round from the same quarter, though with varying speed and temperature. In his book, *By Mountain, Lake, and Plain,* he also describes the windmills, of which he says: "They are of the oldest form known—a tower four-square, slit vertically to allow the passage of the wind; inside, fans of reeds driven round a vertical spindle." These windmills, then, were horizontal. And those described in the tenth century were presumably the same.

Mr. Vowles goes on to show that from the ninth to the eleventh centuries the Northmen traded

largely, via the Baltic, Russia, and the Caspian Sea, with Persia and India. Both Mas'udi and Ebn Haukal personally visited the Volga. Oriental coins have been found in considerable quantities in Russia, Sweden, Holland, Denmark, and even as far away as Iceland and Greenland, which certainly proves that intercourse took place between these countries. Therefore, asks Mr. Vowles, why should not the idea of windmills have travelled from Persia to Holland? In his opinion, though as he says as yet without definite proof, this was the first country in Europe to build windmills. He suggests that the inhabitants of Holland, finding that the fixed horizontal windmills of Persia did not suit their country of more variable winds, altered them to the vertical windmill of similar type to those which exist to-day.

Mr. Jan den Tex, the Secretary of the Dutch Windmill Preservation Society, tells me that, as far as is known at present, the first authentic reference to a windmill in Holland occurs in 1299. In that year Jean, Duc de Brabant, gave Arnold Heyme permission to build a "molendium ad ventum" at Rode (now called St. Œdenrode).

Mr. Vowles named his paper "An Enquiry into Origins of the Windmill" to emphasise that the evidence for his theory is still incomplete. He hopes to complete his investigations and publish a book, with this theory as the basis of a history of windmills.

If Greek windmills did exist as early as the second century A.D., the idea seems to have been forgotten, or at any rate did not travel directly westward, for they appear to have been unknown in Italy in the fourteenth century. In 1332 Bartolomeo Verdi applied to the Venetian authorities for permission to build a windmill. His plans had to be submitted, and were carefully examined; the whole thing being treated as a complete novelty.

Another version of the theory of Greek origin, based on information contained in Bennett and Elton's *History of Corn Milling,* published about thirty years ago, is that windmills developed progressively from the Greek horizontal watermill. The watermill was mentioned by Antipater, a poet of the first century B.C., but he does not describe it. The Roman vertical watermill was probably developed from the horizontal type, and was mentioned by Vitruvius. In it are found the essentials of the vertical windmill. Both work on the same principle, and have a horizontal shaft, so that to replace the blades and rim of the waterwheel with the sails of a windmill is not a very long and difficult step. To change a horizontal windmill, which has a vertical shaft, to a vertical windmill with a horizontal shaft would seem to be a more difficult and unlikely development.

Horizontal windmills have never been a success

in Western Europe, and there are no very early records of them. They have been re-invented or tried out from time to time. The two best-known English examples were built by Captain Hooper in the eighteenth century, and are described at length in the chapter on Surrey (page 74).

The theory that the Saracens used windmills and that the Crusaders brought the idea back to Western Europe has little to support it. The only evidence that I have been able to find to show that the Saracens may have used windmills at that time, is the discovery of the remains of a mill on the outer wall of a Templar Fortress south of Antioch, which was abandoned in 1271. The mill may have stood there for two hundred years or more, or it may not have been old. There is nothing to show its age. At a later date windmills were frequently built on the walls of cities. Paris, for instance, had a large number on her walls in the seventeenth century.

The independent invention of windmills in Western Europe seems unlikely. Most machinery is progressive and diffusive in its development. But the fact remains that at present there is no evidence proving unquestionably how windmills arrived in Western Europe.

As far as is known at present, the first definite mention of a windmill in Western Europe occurs in England. Two of these occur within a few years.

There is a grant of land from Odo de Dammartin to the Priory of Tanrigge, supposed to have been made between 1189 and 1199 in the reign of Richard I., in which a windmill is mentioned as standing on the estate. More definite still, in the chronicles of Jocelyn de Brakelond is the story of Dean Herbert's windmill built on his glebe lands in 1191, which, by order of Abbot Samson, was pulled down again at once. This story is vividly retold by Carlyle in *Past and Present,* and is as follows:

"We said withal, there was a terrible flash of anger in Samson; witness his address to old Herbert the Dean, who in a too thrifty manner has erected a windmill for himself on his glebe lands at Haberdon (so overpowering was the ire of Samson when he heard of it that he could neither eat nor speak). On the morrow, after Mass, our lord abbot orders the sacristan to send off his carpenters to demolish the said structure without delay, and lay up the wood in safe keeping. Old Dean Herbert, hearing what was toward, comes tottering along hither to plead humbly for himself and his mill (urging that surely on his own holding, where no man could deny him the benefit of the wind, he had a right to build the mill which, moreover, he intended merely for grinding his own corn, and which could not, therefore, be imputed to injure the custom of the Abbey mill). The irate Abbot answers: 'I am as

obliged to thee as if thou hadst cut off both my feet! By God's face I will not eat bread till that fabric be torn in pieces. Thou art an old man and shouldst have known that neither the king nor his judiciary dare change ought within the liberties without the consent of Abbot and Convent; and thou hast presumed on such a thing! I tell thee it will *not* be without damage to my mills; for the towns folk will go to thy mill and grind their corn at their own good pleasure; nor can I hinder them since they are free men. I will allow no new mills on such principle (and unless they were built before I became Abbot they shall not remain). Away! Away! Before thou gettest home again thou shalt hear what has become of thy mill.'

"The reverend old dean totters home again in all haste; tears the mill to pieces by his own carpenters (and when the servants of the sacristan arrive nothing to pull down do they find)."

And so this was the end of one of the earliest of England's windmills!

The earliest illustration of an English windmill, so far discovered, occurs on the first page of a Psalter illuminated in the latter half of the thirteenth century, probably about 1270. This is known as the Windmill Psalter (page 4). It was the last book to be bought by William Morris in 1896. He had owned four leaves of it for some little time and did

STORY OF THE UNJUST MILLER: DECRETALS OF GREGORY IX., FOURTEENTH CENTURY.

[By permission of the British Museum.

DECRETALS OF GREGORY IX., FOURTEENTH CENTURY.

[By permission of the British Museum

not know of the existence of the rest. He lent these four pages to an exhibition which was held in the rooms of the Society of Antiquaries in 1896. The next exhibit to his was an incomplete Psalter lent by Lord Aldenham. It was then discovered that these two fragments of a Psalter were written by the same hand. Morris bought Lord Aldenham's part and joined them together. Two Psalms, the Kalender and most of the Litany are still missing. It is now in the possession of Mr. Pierpont Morgan, to whom I am indebted for the permission to reproduce this photograph. He lent the Psalter to the Exhibition of English Mediæval Art, which was recently held at the Victoria and Albert Museum. The windmill in the Psalter is small, but it is quite unmistakably a post mill on a tripod with the usual four sails and tailpole.

The only other thirteenth century illustration of a windmill is in Aristotle's *Physica* (page 3) illuminated in England at that time. This is in the collection of MSS. at the British Museum.

There are several fourteenth-century illustrations. One, dated 1349, is on a Flemish brass to Adam de Walsokne, in St. Margaret's Church at King's Lynn in Norfolk.

Five illustrations of windmills occur in the Decretals of Gregory IX., written in Italy but illuminated in England in the fourteenth century.

Two of them (page 13) tell a story of an unjust miller who treated his client badly. The client, being a person of strong character, set fire to the mill! Another windmill occurs as part of the landscape in a battle scene (page 14). This manuscript belonged to St. Bartholomew's Priory, Smithfield, in the tenth century, and is commonly known as the Smithfield Decretals. It is now in the possession of the British Museum. It is illuminated with narrow band borders with interlacing at the corners, round both the text and glossary. There are grotesque figures between the columns, and the lower margins are filled with coloured drawings illustrating trades, sports, wars, popular tales, animal fables, miracles of the Virgin, and legends of the Saints.

Perhaps the best of all the early windmill illustrations is the one in the Louterell Psalter (page 3), executed for Sir Geoffrey de Louterell about 1340.

After the middle of the fourteenth century illustrations of windmills become more and more frequent. Bibles illuminated at about that time often show windmills in the landscape. This does not mean that windmills existed when those scenes were originally enacted. They merely had taken the fancy of the artist. Rude carvings of post mills are also to be found in church porches, on the towers,

and on the lead roofs. Rarely they are found on carved woodwork in a church (pages 19 and 20).

The oldest known windmill in England, originally built as such, is at Outwood in Surrey, and it is still working (page 82). This mill was built in 1665, and the miller possesses the deed authorising its erection. Its whole history is known, and there is no doubt of its antiquity. Until recently Brill, in ~~Essex~~, was considered to be the oldest windmill. But it was built in 1668, three years after Outwood. Brill no longer works, but has been bought and preserved by a Trust.

In Warwickshire there is a mill at Chesterton which was built in 1632, but it seems improbable that it was originally built as a windmill. Sir Edward Peto had a large house at Chesterton, and the opinion is that Inigo Jones designed an observatory for him. This observatory was at a later date converted into a windmill. It is an unusual structure quite unlike any other windmill, built on six semicircular arches. The milling machinery is of eighteenth-century date. Recently the wooden stairway leading up into the body of the mill was removed. Chesterton Mill is preserved by Lord Willoughby de Broke, to whom it belongs.

Windmills have played quite a large part in the history of kings and wars. They were a fine vantage point in war time, and more than one king has

watched the fortunes of his troops from a windmill. There was a turret post mill on the summit of the hill commanding Crecy, and from this, on August 26, 1346, Edward III. is said to have watched the battle. This mill was demolished in 1881, and it was stated that its walls were seven feet thick.

On the top of Edgehill in Warwickshire stand the ruins of the post mill from which Charles I. saw his first battle. This was the first time his army was defeated. By a strange coincidence he also watched his final defeat at Naseby from a windmill.

Charles II. seems to have had various adventures with windmills and millers while he was in hiding. Humphrey Penderell, the miller of Whiteladies near Boscabel, assisted him in his flight, carrying him on the mill horse for some distance.

The question of who owned the wind was often disputed. In the early days a wind or watermill had "soke" rights, which meant that everyone living in the manor had to send their flour to it to be ground. A mill being rooted in the soil belonged to whoever owned the soil. The wind that blew over the soil belonged to the owner of the soil. Therefore the wind belonged originally to the miller or his landlord. An early document stated that "anyone may construct or erect a windmill on his heritage, provided that it is not within the territory and jurisdic-

Misericorde in Bristol Cathedral.

[*Photo R. G. Dymock.*

PEW IN THORNHAM CHURCH, NORFOLK.

[*Photo R. G. Dymock.*

tion of a lord possessing manorial milling soke rights."

Acts of Parliament were passed in the last century to try and protect windmills from having any building erected so close as to take the wind away. But as land was gradually sold off in small plots and building spread, the question became more complicated. Soke rights had long since died out. If someone bought land near a windmill and erected a large building it was difficult for the miller to protest. At Lewes the Sussex gaol was built close to a windmill. The miller, being an ingenious man, was equal to this, and raised the height of his windmill thirty feet!

Similarly, it was illegal to move a mill without the permission of the lord of the soil. Nevertheless, the moving of a post mill was a fairly common occurrence. In 1768 Sir Charles Peers had a windmill on his property in Bromley. This mill was, he thought, in a disagreeable position. So he removed the whole by means of capstans, four hundred yards at the rate of four yards a day.

In 1797 a post mill was removed from Regency Square, Brighton, to Shaw Road, Preston, a distance of two miles. The mill was dragged the whole way over the Downs by a team of eighty-six oxen, with two others in reserve. It was found more satisfactory to drag these mills by oxen than by

horses, as the former gave a steadier pull. Horses were supposed to jerk more and so break the ropes.

The windmill to-day has undoubtedly come on hard times. It is difficult to see how this can be anything but a dying industry. The work of the miller is hard and often of very long hours. No eight-hour day for him. When the wind blows he must work, often at night as well as in the day, for the wind may take a fancy not to blow for a week or more. If the miller wants to keep his customers he must grind their corn for them as soon as the wind will allow. Partly because of this there are few young men who want to be apprenticed in a windmill. They prefer to find work with regular hours and Sundays off.

Another and greater difficulty that the wind and watermills have to contend with is the white flour that is in demand in England to-day. These mills are unable to produce flour fine enough to pass the test required for "Mark" flour. Whole-meal flour, which they can make, has only a small market now. Therefore the trade of the wind and watermill is almost entirely the grinding of animal foods, such as chicken food, commonly called pig grist.

A good many of the larger farms have their own gas, steam, or oil engines for grinding corn for their animals. And the corn for flour is sent direct to the roller mills in the towns.

So the windmill's trade is sadly depleted, and, ironically, the expenses have gone up. As the wind and watermills have gone out of fashion so the country millwrights have given up specialising in their repair. A century ago there were plenty of millwrights and wheelwrights in every county practised in the repair of wind and watermills. Now there are about half a dozen who really know this work in the whole of England. So when a miller wants his mill repaired, unless he can do it himself, he has to send long distances for a competent millwright. His earnings have gone down and his costs have gone up. The price of putting up a new pair of sails is about £100. Consequently, when a windmill needs some big repair work done, the miller, unable to pay for it, closes down. As often as not the mill is sold for the price of its timbers and pulled down. Others are left to rot until they blow over in some gale. A few smock and tower mills are turned into houses. If this is carefully and sympathetically done, the outside appearance of the mill can be kept almost exactly as it was, and the inside converted into a comfortable home. One or two mills have been lucky enough to be bought by people who are genuinely interested in windmills, and are kept in working condition. It is this that the Society for the Protection of Ancient Buildings would like to do. It would like to raise enough money to buy and

maintain a few good specimens of windmills in different parts of the country. Windmills have carried on an important trade in this country for seven centuries, but they are falling fast, and unless public sympathy is aroused there will soon be very few left to show how corn was ground before the invention of the roller mill.

The possibility of adapting windmills for the purpose of generating electricity has been considered by several people, but does not, on the whole, seem satisfactory. A windmill is a very large structure with an expensive upkeep and irregular hours of work, and electricity can be generated more cheaply and easily by a small petrol engine. Nevertheless, a windmill for this purpose was built last year at St. Margaret's Bay.

The windmill and the sailing ship both belong to the same era and they have characteristics in common. A good strong wind could frighten a timid captain and a timid miller, causing one to take in his sails and the other to stop his mill. It needed as much courage and skill to keep a windmill working in such a wind as it did to carry on in a ship without considerably shortening sail, and there was equal danger for both. If a miller decided to carry on in a heavy wind there was always the danger that the mill would "run away." If this happened, when the miller tried to stop his mill the brake

would fail to stop the whirling sails. The friction set up by a clamp brake on a rapidly revolving wheel which it could not stop would cause a fire. Both wheel and brake were usually of wood. As the whole mill, or in a tower mill the greater part of it, was of wood, once a fire started the mill was doomed. The clever miller knew just when to stop his mill, but sometimes a sudden increase in the wind, or a little too much courage, would lead to the destruction of his mill. In a heavy wind the millstones had to be well fed with grain, or they, too, revolving fast, would send out sparks. By choking them with grain the miller could slow his machinery down slightly.

Windmills belong to the agricultural England of the past, when life moved more slowly. Machinery must develop, and it is likely that in fifty to a hundred years' time there will not be a single windmill working economically under sail. Many people must regret this passing, for, besides being of interest historically and mechanically, windmills are beautiful in a landscape.

CHAPTER II

DESIGN AND DEVELOPMENT

The post windmills built in England in the twelfth century are almost identical with those built recently. For four centuries the mechanism of the windmill remained the same, and although the tower mills, with fantails which automatically turn the sails to face the wind, need less attention from the miller, for actual grinding purposes the original post mill is as good as the windmills invented later. Being smaller and having rarely more than two pairs of millstones, the post mill cannot compete in quantity of production with the big smock or tower mills, some of which, when assisted by an engine, may have as many as eight pairs of stones.

The post mill is a box-like structure carrying the sails and all the machinery. This box is supported at its very middle on the top of a single upright post. Thus it is beautifully balanced so that it may be turned round the post for the sails to face the wind. The post is supported by four sloping struts or quarter-bars, which transfer the weight on it to two cross-trees placed at right angles below the post (page 37). The ends of these rest on brick or stone piers. The socket into which the post fits is in the crown-

tree, a large beam running the full width of the centre halfway up the body of the mill, much as the top stroke of a T. By this the whole body of the mill is supported. The mill has to be turned by hand to face the wind by means of a long pole, which sticks out behind, called the tailpole. In some cases a small winch is built on to the end of the tailpole. A number of short posts are set round the mill, the chain on the winch is unwound, one end is hitched to the post and the chain wound up, thus turning the mill. Another method is to fix a cartwheel to the end of the tailpole and drag it round by horse. As a rule the mill is so beautifully balanced that it is not very hard work for one man to push it round.

But turning the whole mill round was a cumbersome business, and in the middle of the sixteenth century a Fleming, whose name remains unknown, invented the tower mill. In this type of mill the body remains fixed and the top, or cap, alone turns, carrying the windshaft with its sails and gearing. The cap revolves on blocks or rollers on a track or kerb. Horizontal rollers or truck-wheels keep the cap in position on the track. These early caps also had to be turned by hand, sometimes by means of long poles which reached almost to the ground. This is the usual method used in Holland to-day. Other caps were turned by means of a chain wheel, over

which ran an endless chain or rope. This wheel was connected through suitable reduction gearing to the rack, so that when the chain was pulled the cap revolved. Both these methods are still in use in England.

The tower mill is of two kinds. If it is built of stone or brick and circular in shape it is called a tower mill. If built of wood—it has from six to twelve sides, the usual number being eight—it is called a smock mill, from a fancied resemblance to the old-fashioned smock worn by labourers. A smock mill usually stands on a brick base. Some of them are built on this brick base, while others have been raised on to it to give them more height. Round the top of the brick base a wooden gallery or stage is often built, to enable the miller to get at his sails more easily. This stage occurs on tower mills as well. A gallery round the cap is also frequently built.

A variant of these mills may be termed a "composite mill." In this case a post mill type of body is mounted on a short tower of one or two floors on which it revolves on a kerb, no post being used. The majority of these are converted post mills, but one at Laver, in Essex, was originally built this way.

It was not until 1750 that Andrew Meikle, the Scottish millwright, who invented the threshing machine, solved the problem of turning the cap auto-

matically. He fixed to the cap a small fan having six, eight, or ten blades, mounted on a spindle at right angles to the sails and connected by gearing to the rack on top of the kerb. So long as the sails face the wind the fan remains stationary. When the wind veers it strikes the fan at an angle and causes it to revolve. This turns the cap through suitable gearing until the sails face the wind once more. The fan can also be applied to post mills. In some cases it is fixed to the mill body and turns the mill by means of a geared ring fixed to the post. In others it is attached to the tailpole or to the ladder —usually the latter—and drives wheels which turn on a circular track running round the mill.

In 1772 Meikle invented the spring sail. Before this all sails were "common sails," consisting of a framework on which sailcloth was spread or furled to "sword-point," "dagger-point," or "full sail." Each sail had to be set or shortened separately by hand, often an unpleasant and difficult task in cold and wet weather or in a heavy wind. For this operation the mill had to be stopped. The spring sail consists of shutters of wood, or a wire framework covered with canvas, hinged at one edge, and connected together through small cranks to a common sail rod, so that all open and shut together. To this rod is attached a spring, the tension of which can be varied as required by means of a slotted metal

strap or with a screw and nut at the tip of each sail. The tension of the spring is arranged so that a given wind pressure will open the shutters and "spill the wind." These sails suffer also from the fact that they need independent adjustment. When the mill is working, as each sail comes down to the bottom, the shutters, momentarily relieved of wind pressure by the presence of the body of the mill, close with a snap, which in wet weather throws water on to the mill with some force.

No shuttered sail has the driving power of a cloth-spread sail, and it is common practice for a mill to be equipped with two common and two spring sails, the common sails being used for moderate winds only.

To overcome the disadvantage of adjusting a spring sail Mr. (afterwards Sir) William Cubitt in 1807 brought out his "patent sail," so called to this day. A hole is drilled through the windshaft, which, as we have seen, carries the sails and is like a great axle. A rod called the striking rod passes through this hole and is connected to all the sail bars. The shutters are controlled by it with the help of bell crank levers and spider coupling. On the other end of the striking rod is a toothed rack. This engages with a small pinion mounted on a common spindle with a chain wheel. Over this wheel an endless chain hangs down either to a gallery or to the

ground. Weights are hung on the chain, causing the shutters in the sails to remain closed until the wind pressure is sufficiently great to raise them. These weights can be altered at will without stopping the mill, or can be removed altogether and the mill "sailed out." By these means all the sails can be adjusted by a single operation. This arrangement, with modifications, is the most common in use on windmills in England to-day.

Other varieties of sail have been used from time to time, the most notable being the roller reefing sail. In this a number of small canvas roller blinds take the place of the shutters of the patent sail, and are rolled up and unrolled together. The use of this type of sail appears to be confined to Yorkshire. Its disadvantage is that the two straps running from the bottom of one blind to the top of the next frequently break.

An attempt to govern the speed of the sails by means of an air brake was made by Catchpole. At the end of the leading edge of his sails he fixed two long shutters running longitudinally side by side. In a moderate wind these remain closed and give a greater sail area. In a strong wind they open and act as a brake. In both cases they are most effective. The use of this device appears to be confined to Suffolk.

The majority of windmills in this country have

only four sails, but a few exist having five, six, and eight sails, and these are called " multi-sailed mills." As far as is known John Smeaton, of Eddystone Lighthouse fame, was the first person to build multi-sailed mills in England. He favoured five sails, and one mill of his building still stands at Newcastle, though now used as a pleasance. With a few notable exceptions multi-sailed windmills are confined to Lincolnshire and its neighbouring counties. Although a number of five-sailed mills were built—and some are still at work—as at Tuttle Hill in Warwickshire—it was soon found that they had the serious disadvantage that when one sail is damaged the mill must cease working by wind until the sail is repaired or replaced. Six-sailed mills became more favoured, since they can be worked with two, three, or four sails, as indeed some are doing at the present time (1930). Eight sails have been used also, but they are not favoured, and to-day only one such mill remains—that at Heckington, in Lincolnshire. The general opinion seems to have been that they were oversailed.

Some patent sails have shutters on both leading and trailing sides of the stock to which they are fixed; others have shutters on the trailing side only, using a leading board—an early attempt at streamlining. The former are termed double-shuttered, and the latter single-shuttered sails. By many the

double-shuttered sails are considered to act as a brake in anything but a light wind, and a number have been converted to single-shuttered sails with favourable results.

The advantages or otherwise of the annular sail or wind wheel cannot be stated, as few, if any, comparative experiments have been made on corn mills. Only one mill so equipped stands to-day—that at Haverhill, Suffolk.

Tradition in windmill building is very strong. The West remains faithful to common sails and hand chain winding gear. The East has patent sails and fantail winding gear. The South has always had a large proportion of spring sails. Suffolk is remarkable for its post mills, most of which are of one type, tall and narrow, with fantail gear mounted on the ladder—a later addition in most cases. Norfolk, on the other hand, has few post mills, but is remarkable for its tower mills with boat-shaped caps. Lincolnshire also favours tower mills, but with ogee caps, while Cambridgeshire has a large number of smock mills. Types may even be localised, as the smock mills of the Newmarket district. The majority of mills in Kent are of the smock type, but their appearance is quite different from the Cambridgeshire smock, the latter being rather squat while the former are taller and more slender.

The internal economy of the post mill is roughly as follows:

On the windshaft, which carries the sails, is fixed a large, toothed wheel. This is known as the brake wheel, from the fact that to stop the mill a wooden band brake is applied on its outer edge. This wheel drives either one pair of stones direct through another gear wheel, known as the "wallower," or two pairs of stones via the wallower, which is fixed to the top of an upright shaft, at the other end of which and on the floor below is fixed a large spur wheel. This spur wheel drives two small spur pinions, known as stone nuts. In some mills a wheel similar to the brake wheel, but smaller, is fixed on the windshaft at the back of the mill. This is known as the tail wheel, and usually drives one pair of stones direct through a wheel which, though smaller in size, corresponds to the wallower. In all cases provision is made for throwing the wheels out of gear.

The stones are usually regulated automatically by means of a centrifugal governor, which through a system of levers raises or lowers the upper or runner stone, thus allowing a greater or less quantity of grain to enter the space between it and the lower fixed or bed stone. In this way the necessary quantity of the ground corn can be maintained although the speed of the wind may vary and change the speed of the mill.

Corn is fed to the stones either through bins on the floor above or direct from the sacks to the hoppers. The hoppers feed the shoes, which are kept constantly vibrating by means of the squares on the stone spindle if the stones are overdriven, or by a squared piece of iron known as the damsel if they are underdriven. This vibration keeps a constant flow of corn into the eye of the runner stone. From here grain passes through the stones, being ground on its way, finally emerging on their outer edge as meal.

A wooden casing fits closely round the stones and the meal finds its way out through the meal spout into sacks or bins on the floor below.

The amount of grain fed to the stones can be regulated by raising or lowering the shoe. An automatic bell alarm is used to tell the miller when the hoppers are running empty. The principle of this is to nail a piece of leather inside the hopper, fastening a string to the other end of it. The string is then passed out through a hole in the side of the hopper and attached to a bell. So long as the grain rests on the leather and presses it down the weight keeps the string taut and the bell up out of reach of the machinery. When the grain in the hopper runs low the weight of grain is removed from the leather, which is pulled up by the weight of the bell at the other end of the string. The bell

then hangs lower, sufficiently low to be struck by some part of the machinery, thus warning the miller.

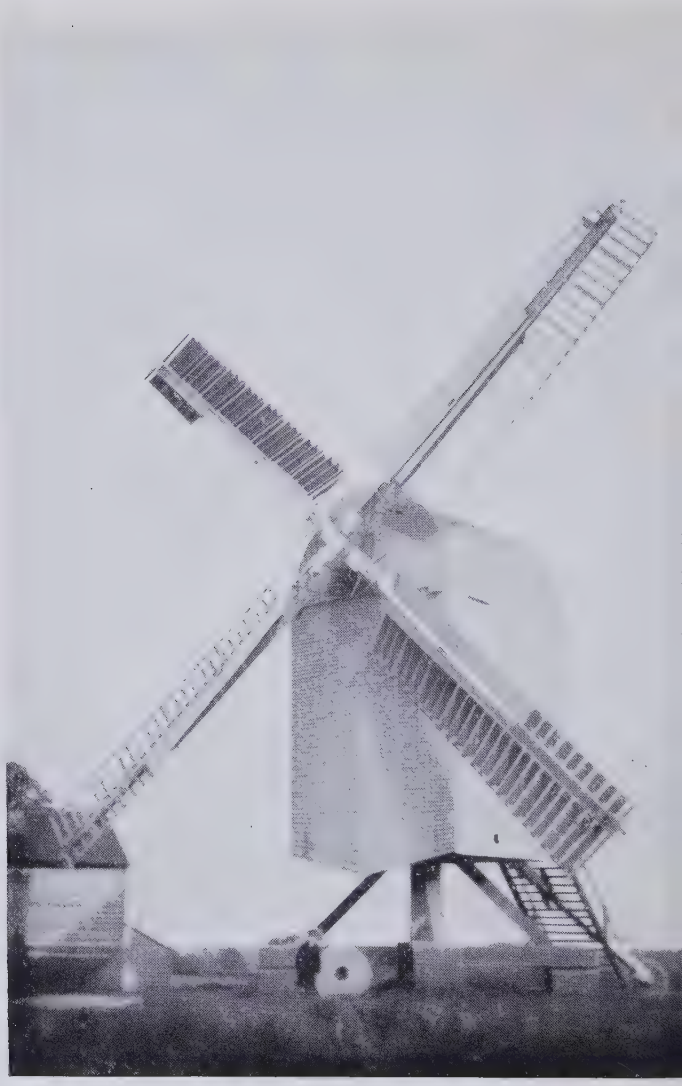
In a smock or tower mill the general arrangement is the same, but the drive is always taken from the brake wheel to the stones by a large upright shaft passing down through the floors of the mill, having a wallower at the top and a large spur wheel driving the stone nuts at the bottom.

It is very difficult to describe the manifold works of a mill in words alone, and few but those with technical experience can follow diagrammatic drawings. The above description of windmills will at least give an idea of the ingenuity of the old millwrights and millers. It is the simple machinery of the slow-changing tradition, and even the later inventions of the eighteenth century have about them the feeling of mediæval rather than modern tradition. In a word, windmills belong to days before the development of the industrial revolution, and with old waggons and agricultural implements are the works of country wheelwrights.

The assault upon windmills by the allied elements, time and weather, effects their deterioration in varying degrees. A post mill being all of timber ensures more or less an even rate of decomposition; sails, ladder, tailpole, body, all fade away together until the inevitable and final crash of doom.

Base of Rolvenden Post Mill.

[*Photo P. Home.*



Chillenden Mill.

[*Photo W. R. Billing.*

The tower mill is different. Its fantail and sails, like the heel of Achilles, being its most vulnerable spot, are the first to vanish, leaving the brick tower and its anatomy to contemplate an unenviable future, unless gas, oil, or steam carry on the work of grinding. But even if unaided by mechanical "doles," its sailless, gaunt tower can still afford to defy for some considerable time the ravages of weather and worm.

CHAPTER III

WINDMILLS IN KENT

THE earliest large scale map of Kent, compiled by Andrews and Drury in 1775 for King George III and his lords shows seventy-eight windmills.* These stood at *Keston*, Bromley Hill, Bexley Heath, Stanstead, Pitfield Green, Chatham, three at Rochester, two at Stroud, Cliff, Hoo Common, *Shorne*, two at Gravesend, Minster in the Isle of Sheppey, Deane Hill, *Boughton Street*, *Sheldwich*, *Hern*, *Wingham*, Gilton, Ringleton, three near *Sandwich*, Worth, two at Stoner, Clive Farm, two at Birchington, *Ramsgate*, Upton, *Bidborough*, Tunbridge Wells, Broad Oak, Hawkhurst, Ringle Crouch Green, *Rolvenden*, *Cranbrook*, *Sissinghurst*, *Biddenden*, Challock Lees, three at *Stelling Minnis*, Botsham, Ley Court, Axted, Liminge, Elham, *Kennington*, *Woodchurch*, Beterisden, Tenterden, *Whittersham*, two at Old Romney, two at New Romney, two at The Rype Lyd, two at Folkestone, *Uphill*, Wingmore, Upper Eython, East Langdon, Deal, two at *Eastry*, Little Betshanger, two at Frogham, one at *Smarden*.

* The names of places where mills are still standing are printed in italics.

How recently the windmiller's trade has died is shown by the fact that there are still the remains of sixty-eight windmills in Kent. Of these many are mere ruins, and only fourteen work under sail. A few more, though no longer worked by wind, have had engines attached and work thus mechanically aided.

The district round Rochester has one of the saddest stories of vanishing windmills to relate. Less than sixty years ago over forty active windmills could be seen from the neighbouring hills. It is since 1883, when there were twenty-nine at work, that the tragedy has developed. One after another the mills have been pulled down, or accidentally burnt and never replaced; for the town has spread, corn fields disappeared, and roller mills have been erected in their stead. Now only one windmill remains, that at Delce, in Rochester.

Only two multi-sailed mills have been recorded in Kent; a smock with six sweeps at Great Chart, which was pulled down some years ago, and a five-sweep mill at Sandhurst. This mill still stands, but is derelict; one sweep has fallen and the other four are sadly battered (page 68).

Kent probably has more working windmills than any other county except Norfolk, Lincoln, and Suffolk. It can claim the distinction of having built a new mill this year at St. Margaret's Bay.

This is not a grist mill, but has been built for generating electricity. It is difficult to say which is the oldest mill in Kent, but the honour probably rests with either Ash, Shorne, Smarden Bell, Keston, or Rolvenden.

Nearly all the windmills in Kent are octagonal smocks on a brick base with a stage, four sails and a fantail.

Ash, near Canterbury (Frontispiece), known as Mount Ephraim Mill was built in 1735. It is a post and round-house with two common—*i.e.,* cloth covered—and two shuttered sails and a tailpole.

The round-house is of wood, the walls being between four and five feet high. The roof is made of much longer planks and is steeply sloped. Some forty-five years ago it was derelict. It was bought and repaired, and is now working.

Barham, near Canterbury (*page* 43), was built in 1834 by John Holman, of Canterbury. It is an octagonal smock, covered with tarred sheeting and standing on a brick base, which has a stage. The four single-shuttered sweeps and the fantail are painted white. The mill has four pairs of stones and is working.

Bekesbourne, near Adisham, is an octagonal smock mill which has been tarred. It has four sails and a fan, though it is no longer working and is falling into disrepair. It is leaning over owing

OARE.

[*Photo W. Coles Finch.*

BARHAM.

[*Photo M. R. Packer.*

CHELTENHAM

DOVER, MARTIN MILL.

[*Photo W. Coles Finch.*

RUSSELL UNION MILLS, CRANBROOK.

GUSTON, SWINGATE MILL.

[*Photo W. Coles Finch.*

STANFORD MILL, 1928.

[*Photo H. Sheldrick*

KENNINGTON.

[*Photo M. R. Packer.*

SHORNE.

[*Photo W. Coles Finch.*

to a weakened cant post. The mill was probably built during the last century.

Benenden, near Cranbrook, is an octagonal smock, painted white, on a brick base with a stage. The four sails and fan have gone.

Bethersden Mill stands about five miles out of Canterbury on the right-hand side of the road to Tenterden. The mill stopped work four or five years ago, and is decaying rapidly. It is an octagonal smock on a brick base with a stage. The fan and two sweeps have gone, also a good deal of the stage. The other two sweeps are still in position, but sadly broken.

Bidborough was struck by lightning about thirty years ago, and two of the sweeps fell. Soon afterwards the other two and the fan were taken down, and the mill has not worked since. The stone tower is in fairly good condition. It stands some way to the right of the road from Tonbridge to Tunbridge Wells.

Biddenden, north-west of Tenterden, on the road to Cranbrook is an octagonal smock mill. It stands on a two-storied brick base, which is used as a labourer's cottage. One of the four sails has broken off and the others are in bad condition. The fan fell in May, 1930.

Boughton-under-Blean, Richardson's Mill, east of Faversham, is an octagonal smock on a brick

base with a stage. Some years ago it had to close down, owing to lack of money for repairs, and the four sweeps were taken down. More recently the cap has been removed, and the mill is now derelict. This mill was geared very high, the sweeps revolving twice when the sails of the mill at Boughton Street only revolved once.

Boughton Street, Mile's Mill, is about one hundred and thirty-five years old and was working under sail until quite recently. This also is an octagonal smock, painted white. It is set on a brick base, and has a stage. It is five stories high and has three pairs of stones. The sails and fan have been taken down and stored, and the mill is now worked by engine. It is in good condition, but is for sale.

Bridge, near Canterbury, on the Dover road, is a derelict octagonal smock, covered with tarred sheeting, on a two-storied brick base. The fan has gone, and only the stocks of two out of the four sweeps remain.

Canterbury, St. Martin's Hill, built by Cozens in 1817, ceased working as long ago as 1890. It is a stone tower mill, which is in good condition, though the fan has gone and only the stocks, or midlings as they are called in Kent, of the four sweeps remain.

Great Chart, near Ashford, was originally an

octagonal smock with six sweeps—the only mill with six sweeps known to have been built in Kent. All that remains of this fine mill is the wooden base now used as a shed.

Charing, north-west of Ashford, also a smock on a brick base, is kept in good condition, though its sails and fan have gone.

Chillenden Mill (*page* 38) stands on a hill in the heart of the country in the centre of the triangle made by Canterbury, Sandwich, and Dover. It is a post and open trestle built about fifty years ago, and painted white. It has four single-shuttered sails and a tailpole resting on a wheel. In 1927 it had two sails renewed. The mill is in very good condition and working, but is for sale.

Cranbrook, Russell Union Mills (*page* 44), was built in 1814 by Humphreys for Henry Dobell. It is as fine a windmill as any in England, a large octagonal smock on a three-storied brick base with a gallery thirty feet from the ground. All the woodwork is painted white. It measures seventy-two feet from the ground to the cap. It has four double-shuttered patent sails, a fan, seven pairs of stones, and, in addition, a gas engine. This mill works hard all the year round grinding flour and pig grist, but in spite of its good trade the owner, Mr. John Russell, says that when all expenses are paid he only makes a profit of a few shillings a year. This is a

typical example of the present economic state of the windmill, for although this mill has plenty of work the cost of wages and upkeep is so large in comparison to the money earned that when any big repairs become necessary there will be insufficient money to meet them.

Doddington, about six miles south-west of Faversham, an octagonal smock on a very low brick base, has been for sale for some time and will probably be pulled down. The fantail and the stocks of the four sails are still in position.

Dover, Martin Mill (*page* 44), is a broad octagonal smock on a brick base with a stage. The mill has been converted into a house. The fan has been removed and the four sweeps cut very short, which sadly spoils its appearance.

Eastry Upper Mill (*page* 54), south-west of Sandwich, is alone left of a pair of fine smock mills which were both working by wind early this century. One of the mills has been pulled down, and the remaining one has had the sweeps and fan removed. This mill has four pairs of stones, two for wheat and two for barley, and is now worked by a gas engine. It is about two hundred years old. The photograph, taken in 1905, shows the two mills in working order. The nearer one has been pulled down.

Edenbridge, due west of Tonbridge, close to the

KESTON.

[*Photo M. R. Packer.*

NORTHBOURNE OLD MILL, 1929.

[*Photo M. R. Packer.*

CHELTENHAM

ROLVENDEN MILL.

HEADCORN MILL.

[*Photo S. Abram.*

HERNE MILL.

[*Photo M. R. Packer.*

THE SAD REMAINS OF MILTON REGIS.

[*Photo M. R. Packer.*

CHELTENHAM

EASTRY MILLS IN 1905.

[*Photo W. Coles Finch.*

WALTHAM MILL.

[*Photo W. Coles Finch.*

Sussex border, is a derelict tower mill without sails or fan.

Frittenden (*page* 78), north of Cranbrook, is a post and round-house mill with the four single-shuttered sweeps still up, but in bad condition. The windshaft is broken and the sails are hanging down from the mill, as can be seen in the photograph. The round-house is of brick with a wooden roof. The mill, which is painted black, is for sale, and as it is in such bad condition will probably be pulled down.

Guston, Swingate Mill (*page* 45), about three miles north of Dover, is a stone tower mill with four single-shuttered sails and fan. It is working and in good condition. It is for sale.

Hawkinge, north of Folkestone, is a derelict octagonal smock mill on a brick base. The fan has gone, and only the stocks of three out of the four sails remain.

Headcorn Mill (*page* 52), north-east of Cranbrook, stands on a rise north of the village of Headcorn. The mill was derelict some years ago, but was bought and repaired and is now working. It is a white octagonal smock on a brick base with a stage and has four single-shuttered sails and a fantail.

Herne Mill (*page* 53), three miles south of Herne Bay, is finely situated on the brow of a hill. Built in 1781, it is a large octagonal smock mill, painted

black, on a two-storied brick base with a stage. Two of the four sails were taken down recently, as they became unsafe. The mill is otherwise in good condition and working. It has a fantail winding gear.

Hildenborough, Watt's Cross Mill (*page* 59), stands close to the Sevenoaks—Tonbridge road, and is a white octagonal smock mill on a two-storied brick base with a stage. It stands in a private garden, and, though no longer working, is looked after. The four sails have had the shutters removed. The cap was turned by a wheel and rope winding gear.

West Hougham, between Dover and Folkestone, is an octagonal tarred smock mill on a wide brick base, which had a stage. The cap, sweeps, and fan are painted white. The mill was built in 1802. It has only two sweeps, and two blades of the fan have gone, but it is still working, and has two pairs of stones. The other two sweeps were taken down in 1926. Flour has not been made in this mill for twenty years.

Kennington (*page* 46), north and a little east of Ashford, is a tall octagonal smock mill on a two-storied brick base with the remains of a stage. It stands on high ground, and is a landmark for miles around. The sails and fan have been removed, and it is at present derelict, though the owner hopes to be able to repair it. A stone over the door is dated 1813.

Keston (*page* 51), on Keston Common, west of the Bromley—Westerham road, is a post and round-house mill in fairly good condition except for the four sails, which, though still up, are broken. The round-house is of brick with an iron roof. This mill was probably built late in the seventeenth century.

Kingsdown Mill (*page* 60), on the right of the London—Dover road between Farningham and Wrotham, had one of the sweeps damaged in a gale last December. The framework of the other three and the fan are still up, though the latter is broken. The sweeps were covered with canvas. It is an octagonal smock on a brick base, and it has been tarred recently.

Kingston, Reed Mill, south of Canterbury, is a brick tower used as a store. About thirty years ago, when the fan was being repaired, the mill was tail-winded and the cap blown off.

Kippings Cross, Key's Green, east of Tunbridge Wells, had the cap blown off about twenty years ago, having ceased work some five years previously. The brick tower has been roofed over and is used as a store.

Leigh, Stocks Green (*page* 67), about a mile west of Tonbridge, is an octagonal smock mill on a brick base with four single-shuttered sails and fan-tail. It is working and in very good condition. The

mill is painted black, the cap, sails, and fan white. A notice above the door reads:

"Erected 1723
Burned 1797
Rebuilt 1798
Restored 1928"

and underneath it is a text from Ecclesiastes. "He that observeth the wind shall not sow, and he that regardeth the clouds shall not reap." The mill stands in a field close to a fine tithe barn, which has been converted into a restaurant. Outside the barn are the village stocks.

Margate, Drapers Mill, is a smock on a brick base with a stage, without sails or fan, but worked by engine. It was built in the nineteenth century by Thomas Holman, of Canterbury.

Milton Regis (*page* 53), north of Sittingbourne, is a derelict octagonal smock mill on a brick base. The stage and fan have gone, two of the four sweeps have broken off short and the others have lost many of their shutters.

Nonnington, south-east of Canterbury, is a smock without a cap, it having been blown off about eight years ago. The mill is covered with tin sheeting and is worked by engine. It was built about one hundred and twenty years ago.

Northbourne, west of Deal, has two octagonal

WITTERSHAM, STOCKS MILL.

[*Photo W. Coles Finch.*

HILDENBOROUGH, WATT'S CROSS MILL.

[*Photo W. Coles Finch.*

CHELTENHAM

RINGWOLD, RIPPLE MILL.

[*Photo W. Coles Finch.*

KINGSDOWN.

[*Photo W. Coles Finch.*

SMARDEN.

[*Photo W. Coles Finch.*

SMARDEN BELL.

[*Photo W. Coles Finch.*

PLUCKLEY.

[*Photo M. R. Packer.*

DELCE MILL, ROCHESTER.

[*Photo W. Coles Finch.*

smock mills, the **New** and the **Old Mill,** both tarred with white sweeps and fantails. Both these mills are working with two sweeps. The **New Mill** is the taller and has a brick base with a stage. It was built by Thomas Holman in the latter half of the nineteenth century. The **Old Mill** (*page* 51), which had become derelict, had two new sails put up in July, 1928, and was thoroughly repaired and started working.

Northwood, Thanet Mill, near Ramsgate, is a five storied tower mill now worked by engine, the four sails and fan having been removed. When this mill was first built it had only three stories, and, being so low, did not work well. The cap was taken off and two more stories were built up vertically. This accounts for its curious shape.

Oare (*page* 43), north of Faversham, is a derelict brick tower mill five stories high. The fan and one of the sweeps have fallen. The other three sweeps are broken but still in position.

Pluckley (*page* 62), west of Ashford, is a very battered octagonal smock, four stories high and set on a brick base. The fan, stage, and two of the sweeps have gone, the other two being very broken.

Preston Mill, north of the Canterbury—Sandwich road, is an octagonal smock with a brick base and a stage, but without sweeps or fantail. The mill was tailwinded during a gale in 1918 and the sweeps

went round the wrong way, thus damaging the machinery. Since then it has been worked by an oil engine. The date 1778 is cut into the brickwork.

Preston, near Faversham, is an octagonal smock on a brick base with a stage. The sweeps and fan have been removed, but otherwise it is in good condition. The mill is for sale.

Ramsgate, Newington Mill, north-west of the town, is a tarred octagonal smock, which, although no longer working, is in fairly good condition. The four sweeps have had the shutters removed, but they and the fan are still in position.

Reculver, east of Herne Bay, is an octagonal smock without the cap. It has been roofed over and is used as a store.

Ringwold, Ripple Mill (*page* 60), is a short broad smock on a brick base, working with two sweeps and a fantail. The mill is tarred and in good condition. The cap is also tarred, but the sweeps and fantail are painted white.

Rochester, Delce Mill (*page* 62), is the only one of some twenty-two which at one time existed in the city of Rochester. It was built in 1872 on the site of an older mill which was burnt. This is a tall octagonal smock mill covered with sheeting, on a two-storied brick base with a stage. It has four double-shuttered sails and a fan. It is in good condition and working.

Rodmersham Mill, south of the Sittingbourne—Faversham road was built in 1836. It is a derelict stone tower mill; the fan has gone and only the stocks of the four sweeps are left.

Rolvenden (*page* 52), south-west of Tenterden, is a post mill with two tattered sweeps and a tailpole. There were originally four common sweeps. The round-house, which was of wood, was pulled down for firewood during the war. "Allen, 1828," is cut on the centre post, but this is probably the name and date of a miller. The mill is almost certainly much older.

Sandhurst (*page* 68), south of Tenterden, was built about fifty years ago by a famous Kentish millwright of the name of Warren, and was in fact known as "Warren's Masterpiece." It was a fine octagonal smock mill, painted white, on a brick base with a stage, and had five single-shuttered sweeps and a fantail. The only five-sailer in Kent, it is now a sad derelict. One sail has broken off and the other four are without shutters and in bad condition. The fan and the stage have gone.

Sandwich, The White Mill (*page* 77), has recently lost two sweeps, and only the stocks of the other two remain. The fan has also gone. It is an octagonal smock, covered with sheeting, on a brick base with a stage.

Sarre, on the Margate—Canterbury road, is a

tarred smock mill without sweeps or fan and is worked by a gas engine. The brick base was originally only one story, but was raised to two.

Sheldwich, Boundgate Mill, south of Faversham, must have been a fine mill in its day. It is a big octagonal smock on a two-storied brick base. The stage, fan, and four sweeps have gone.

Shorne (*page* 46), north-west of Rochester, has been a post and round-house mill. The exact date of building is uncertain, but it claims to be nearly two hundred years old. The sweeps were removed and it was converted into an observatory about fifty years ago. It was then made stationary, underpinned with brick, and an extra piece built on at the back.

Sissinghurst (*page* 69), near Cranbrook, is an octagonal smock, painted white, on a brick base. The sweeps and fan were taken down in May, 1928.

Smarden (*page* 61), north of Tenterden, is an octagonal smock mill on a brick base, built about 1800. It stopped working a year or two ago. The mill is covered with tarred sheeting, the cap, fan, and sails being painted white. The four sails are still up, though they are getting broken, and the shutters have been removed. The fantail has been dismantled.

Smarden Bell (*page* 61) claims to be the oldest windmill in Kent, for previous to 1680 there was a

Leigh, Stocks Green Mill.

[*Photo W. Coles Finch.*

SANDHURST MILL IN WORKING CONDITION.

[Photo W. Coles Finch.

SANDHURST, 1930.

[Photo W. Coles Finch.

SUTTON VALENCE.

[*Photo N. Coles Finch.*

SISSINGHURST.

[*Photo G. C. Druce.*

WILLESBOROUGH.

[*Photo W. R. Billings.*

STELLING MINNIS.

[*Photo W. Coles Finch.*

dispute as to who should repair the round-house. But whether it was the round-house of the present mill or a previous one is not definite. The local inhabitants also say that there has been a windmill on this site since the twelfth century. It is a post mill with a brick round-house painted white. The four sweeps, which are still in position, were canvas covered. It has three pairs of stones. The tailpole has been broken off, and the whole mill is in bad condition.

Stanford (*page* 45), north of Hythe, was built in the last century by Holman Bros., and is a six-storied tarred brick tower with a stage. In January, 1930, one of the stocks broke and fell. The mill was repaired and is now working under two sails. It has a fantail.

Stelling Minnis (*page* 70), about ten miles south of Canterbury, is an octagonal smock mill built in 1866 and now worked by oil engine. The four sails and fan are broken and in bad condition.

St. Margaret's Bay, although not strictly a mill, must be included, for from the outside it is a very fine-looking specimen. It has been built by Messrs. Holmans, of Canterbury, for generating electricity, and started working in this capacity in June, 1929. It is a smock, tall and slender, on a brick base with a stage, and has four shuttered sweeps and a fan. The body of the mill is brown,

the cap, sweeps, fan, base, and stage being painted white.

Sutton Valence (*page* 69), an octagonal smock mill built at the beginning of the nineteenth century, was raised on to a brick base about thirty years later. The fantail and four sweeps have been dismantled, leaving only the stocks. The stage is in bad condition. The mill stands in a private garden, and one out of the four pairs of stones is worked by a gas engine.

Uphill, near Folkestone, is a smock mill in bad condition and no longer working. It is eight-sided, without a brick base, and is tarred. Two of the four sails are still up, but the shutters have been removed.

Waltham (*page* 54), south of Canterbury, is a very derelict smock on a brick base. Two broken sweeps are still up, the other two and the fan having fallen. A good deal of the weather-boarding on the cap and body of the mill has rotted away.

Whitstable (*page* 77), an octagonal smock mill built early last century, has had all the machinery removed. A house has been built adjoining it, and the mill converted into living rooms. The fan has been taken down and only the stocks of the four sails remain. The whole mill is tarred.

Willesborough (*page* 70), near Ashford, on the road to Hythe, is a white octagonal smock on a brick

base with a stage. It has four single-shuttered sails, which are getting into bad condition, and a fantail. The mill was built in 1869 by Hill, of Ashford, and is still working, assisted by an electric motor.

Wingham (*page* 78), south of the Canterbury—Sandwich road, is a brick tower mill with a stage. It is now worked by steam. Two of the sweeps and the stocks of the other two are up, but the fan has been dismantled.

Wittersham, Stocks Mill (*page* 59), is a post and round-house with four shuttered sails and a tail-pole. It is not working, but is well looked after, and stands in a private garden. The round-house is of brick, with a wooden roof covered with sheeting. The body of the mill, with the sweeps, steps, and tailpole are painted white.

Woodchurch, east of Tenterden, has the remains of two smock mills close together. The cap has gone from one of them, and it has been roofed over and used as a store. The other still has its four sails, fantail, and stage, but it is not working, and is getting into a bad condition.

CHAPTER IV

WINDMILLS IN SURREY

The earliest mention of a windmill in Surrey, and it is definitely mentioned as a wind and not a water or cattle mill, occurs in a grant from Odo de Dammartin to the Priory of Tanrigge, which was probably made in the reign of Richard I., between 1189 and 1199. This is one of the earliest known references to a windmill in England.

Rocque's map of Surrey, made in 1765, and the first large-scale map to be made of that county, shows eighteen windmills. In those days there was no county of London, and Surrey was bounded on the north by the Thames, which had a number of windmills along its banks.* Those on the Surrey bank were at Nine Elms, Wandsworth, and Putney. The other mills shown on the map were at *Ewhurst, Lovel Heath* (Lowfield Heath), *Capel,* four around Ryegate, one at *Outwood,* Horley Common, Tilbuster Common south of Godstone, Home Wood Common, Chiddingfold, Warlingham, Broad Green near Croydon, Chaldon, Ditton, Walton, and Camberwell.

* The names of places where mills are still standing are printed in italics.

Soon after the beginning of the nineteenth century Captain Stephen Hooper erected a horizontal windmill at Battersea (page 81). This was a replica of a mill he had invented and built at Margate during the latter half of the preceding century. Captain Hooper was a master mariner and a skilled mechanician who retired from the sea and, with his sons, started work as a miller. This form of windmill consisted of a tower, on the top of which was a large wheel fitted with vanes, which the inventor called "flyers." It was not unlike a paddle wheel, and revolved on a horizontal plane. This wheel was surrounded by a casing of slabs, like the guide blades of a turbine, and which could be opened or closed like a venetian blind so as to allow the wind to blow on one half of the wheel while the other half was screened. A shaft fixed to the wheel drove the stones in the ordinary way. The mill at Margate had five pairs of stones. It was working in 1825, but a few years later it was so severely damaged in a gale that it was not repaired, and was eventually pulled down.

Captain Hooper sold his Margate property in 1801 and moved to Walworth, from where he superintended the building of his Battersea mill. This, though similar to his Margate mill in most respects, was designed for grinding linseed. After a few years it was converted into a malt mill, and was

working in this capacity in 1811. The cost of the upkeep of mills of this kind was found to be very heavy in comparison to the power obtained, and the Battersea mill gradually fell into bad repair and was taken down.

Out of the eleven windmills of which any trace is left in Surrey (October, 1930) only one is working. But this one has as great a claim to fame as any windmill in England, for it is the oldest one known. It is the post mill at Outwood, near Reigate (page 82), built in 1665.

Surrey has recently lost one fine old mill and seems likely soon to lose more. Last December the post mill at Nutley was pulled down and its timbers sold. Coulsdon has almost disappeared, and Ockley is in such a bad state that it is a wonder that it has survived so long.

Capel, Shiremark Mill (*page* 84), on the borders of Surrey and Sussex, is claimed by both counties. Actually it stands a few yards within Surrey, about five miles north of Horsham, close to the London—Worthing road. It is an octagonal smock, tarred, and on a brick base, with four sails still in position and a chain and wheel winding gear. The mill is in fairly good condition, though it has not worked for some time. It is sometimes erroneously called Kingsfold, this being the nearest Sussex village.

Coulsdon is on the east side of the London—

THE WHITE MILL, SANDWICH.

[*Photo W. Coles Finch.*

WHITSTABLE.

[*Photo W. Coles Finch.*

FRITTENDEN.

[*Photo M. R. Packer.*

WINGHAM.

[*Photo M. R. Packer.*

Croydon road, and all that remains of this mill is the brick base.

Ewhurst, Hurtwood Common (*page* 83). This is a four-storied brick tower mill, which has been tarred. It was built about ninety years ago on the site of another mill, which was blown down. The machinery has been removed and the tower converted into a house. In 1914 four new sails were put up with shutters in them, but they are considerably shorter than the original working sails. The fan has been removed. The mill stands in a clearing amongst the trees on one of the highest points of this Surrey common, eight hundred and twelve feet above sea level. Not far below it is the Windmill Inn, about two miles from Ewhurst, on the road to Shere. This part of Surrey was a famous smuggling district, and both the inn and the mill, an earlier one, are reputed to have been used as haunts and hiding-places for contraband goods.

Lowfield Heath Mill, about two miles north of Crawley and close to the London—Brighton road, is a forlorn relic. It stands by itself in a flat field, an old post and round-house mill without sails, these having been blown off in 1927.

Ockley (*page* 87), south of Leith Hill, must in its day have been a very fine smock mill. Even now it stands grandly on a rise, with a perfect view of unspoilt Surrey-Sussex scenery behind it. The cap

no longer turns, so the two sails are always facing the approach from the road. On the lintel of the door are two half obliterated dates, which are difficult to account for. The upper one begins 15—, and the lower 17—. Perhaps the beam came from an earlier post mill to which the sixteenth-century date refers; the smock being built at the end of the eighteenth century. But there is no mention of a mill at Ockley in Rocque's map of Surrey dated 1765.

The structure is in the most dilapidated condition possible. Of the four sails, two are still up though very tattered, and the remains of the other two lie where they have fallen. The mill had a wheel and chain winding gear. It has a brick base, round the top of which runs a gallery or stage, which is now rotting away. The weather-boarding to about halfway up the smock has gone from three of the eight sides, leaving the millstones and machinery exposed. The whole of the first floor has fallen and lies inside the mill. In some gale soon to come, even if the mill does not fall, the beams carrying the stones must give way. About a year ago, when the owner of Ockley Mill heard that the Society for the Protection of Ancient Buildings had started a campaign for preserving windmills, he approached it in the hope of getting help to repair the mill. The first floor was then still in position, but the wood

HORIZONTAL MILL, BATTERSEA.

[*By permission of Mr. Ambrose Heal.*

WIMBLEDON COMMON MILL.

[*Photo R. Wailes.*

Reigate Heath Mill.

[*Photo H. Skipper.*

The Post Mill at Outwood.

HURTWOOD COMMON, NEAR EWHURST.

[*Photo K. N. Beach.*

REIGATE, WRAY COMMON.

[*Photo H. Lloyd.*

Shiremark Mill, Capel.

throughout the mill was so rotten that repair was out of the question. The mill would have had to have been completely rebuilt with new wood.

Outwood Common (*page* 82), in the parish of Burstow, has two mills standing close together, one working and the other derelict. The post mill, which is still working, at present holds the distinction of being the oldest known windmill in England, and, what is more unusual still, the miller possesses the deed relating to its building. It runs as follows:

THIS INDENTURE made the Eleventh day of October in the seventeenth year of the Reign of our Sovereign Lord Charles the Second by the grace of God of England Scotland France and Ireland King defender of the Faith Anno Domini 1665 Between Richard Paine of Westhoathly in the County of Sussex Lord of the Manor of Burstowe in the County of Surrey of the one part and Thomas Budgen of Nutfield in the County of Surrey Miller of the other part WITNESSETH that the said Richard Paine for divers good causes and considerations him thereunto * enabling * HATH demised granted and to farme letten and by these presents doth demise grant and to farme lett unto the said Thomas Budgen that peece or parcell of land and a windmill thereupon newly erected and

* Here the writing is too faint to decipher.

built by the said Thomas Budgen containing by estimation halfe an acre situate lying and being in the parish of Burstowe aforesaid neere the Lane there called Bletchingly lane and being part of the wast-ground belonging to the said Mannor of Burstowe To HAVE AND TO HOLD the said peece or parcell of land and Mill with the appurtenances unto the said Thomas Budgen his Executors Administrators and Assigns from the Feast of St. Michaell the Archangell last past before the date hereof unto the full end and terme of Five hundred yeares from thence next ensueing and fully to be compleat and ended YEILDING AND PAYING therefore yearely and every yeare during the said terme unto the said Richard Paine his Executors and Assigns the yearely rent or sume of five shillings of lawfull money of England at the two most usuall Feasts or termes in the yeare that is to say at the Feasts of the Annunciation of the blessed Virgin Mary and of St. Michaell the Archangell by equall portions And if it shall happen the said yearely rent to be behind or unpaid in part or in all by the space of one and twenty daies next over or after either of the said Feast dayes on which the same ought to be paid as aforesaid that then and from thenceforth and soe often as the same or any part thereof shall be behind as aforesaid it shall and may be lawfull to and for the said Richard Paine his heirs and Assigns or any of them into the

Ockley Mill.

Hailsham Mill.

Ashurst Mill.

[*Photo H. Lloyd.*

said demised premises or any part thereof to enter and distreynt and the distresse and distresses there found from time to time to take load drive and carry away and in his their or any of their possession and custody to detayne and keepe untill the said rent and arreayes thereof shal be fully satisfyed and paid and for default of payment thereof within seaven dayes next after every such distresse and distresses soe taken as aforesaid that then and soe often as the same shall be unpaid after the end of seaven daies next after the taking of such distresse and distresses it shall and may be lawfull to and for the said Richard Paine his heirs and Assigns from time to time to sell convert and dispose the said distresse and distresses and out of the moneys thereby raised to pay and discharge the said rent and arreares thereof together with all damages costs and charges sustayned by reason of the taking detayning and keeping of the said distresses rendring the surplus (if any be) unto the said Thomas Budgen his Executors Administrators and Assigns And the said Thomas Budgen for himself his Executors Administrators and assigns doth covenant and grant to and with the said Richard Paine his heirs and Assigns by these presents that he the said Thomas Budgen his Executors Administrators and Assigns shall and will from time to time and at all tymes soe often as need shall require during the said terme at his and their own expense

costs and charges well and sufficiently repair amend maytayne uphold and keep the said wind-mill with its appurtenances in by and with all needfull and necessary reparous (erasure) and amendments whatsoever and the Mill with its appurtennces and all other the said demised premises soe well and sufficiently repaired and amended as aforesaid in the ende or other sooner determination of the said Terme (which shall first happen) shall and will leave and yield up unto the said Richard Paine his heirs or assigns And the said Richard Paine for himself his heirs Executors and Administrators doth covenant and grant to and with the said Thomas Budgen his executors administrators and assigns by these presents That it shall and may be lawfull to and for the said Thomas Budgen his Executors administrators and assigns by and under the payment of the said yearely rent and performance of the covenants herein contained on his and their part to be paid and performed according to the true intent and meaninge of these presents from time to time and at all times hereafter dureing the said Terme hereby demised peaceably and quietly to have hold possess and enjoy the said demised premises with the appurtenances without the lawfull lett suite deniall eviction ejection or molestation of him the said Richard Paine his heirs or assigns or of any other person or persons lawfully clayminge by from or

under him them or any of them In Witness whereof the parties to these presents have hereunto interchangeably sett their hands and seals the day and yeare first above written.

RICHARD PAINE

Tradition has it that the Fire of London was seen from the top of the mill. Another document, dated 1868, shows when it passed into the possession of the Jupp family, who now own it. It was at about this date that the smock mill was built by a brother of the miller of the post mill. The smock was built to supersede the old mill and to take its trade, but the veteran held its own, and when business became less it was the new mill which closed down. It is a tall hexagonal smock on a brick base with a stage. Two of the four sails and the fan have gone, and the whole mill is in bad condition. Offers have been made to buy and remove it, but fortunately the owner has not agreed. The post mill may have had an open trestle when it was first built, but when the brick round-house was added is not known. The whole mill was probably raised then on to the brick pillars, round which the brick shelter was built. Except for this addition the mill is much as it was in the seventeenth century, though one or two parts originally of wood have been replaced by iron. The oldest windmill in England, it is the only one

working in Surrey. Early this century it was working with four sails, but now, alas! it has only two.

On Reigate Heath (*page* 82) there stands a post and round-house mill, the lower part of which has been converted into a chapel. The whole structure is in good repair and carries the framework of four sails, though it has had a fantail incorrectly placed low down behind the roof. The tailpole, the original and proper method of turning this mill, has been removed, as have also the steps leading up into the mill itself. Services are held regularly in the brick round-house.

Reigate, Trumpet Hill, is a smock mill without a brick base which stands in a private garden. It stopped working in 1896. Now the framework of one sail and the stock of another are all that remain of the original four.

Reigate, Wray Common (*page* 83). This is a tower mill with four sails, a fantail, and a fan gallery. It stands on Wray Common close to the Reigate—Croydon road, and, although it is no longer working, its owner keeps it in good repair. Four new sails have recently been put up, though without shutters. The cost of keeping sails with shutters is considerable, and if a mill is not working it is more satisfactory to have the sails without the shutters, for thus there is less resistance to the wind.

Shirley, near Croydon, is a five-storied tower mill

no longer working and falling into disrepair. The fan has gone and two of the sails have broken off short, the other two being very battered. It was built about 1860.

Wimbledon Common (*page* 81). The date of the building of this well-known mill seems uncertain. It is not shown on the first Ordnance Survey Map, made in 1806, but was probably built soon after. It was built as a hollow post mill, the only one in England of which any trace is left, but during this century it has been converted to a composite mill. It is built in three parts—the top part, externally shaped like a post mill, is no longer supported by a central post, but is built on a framework. This part turns on a kerb, as the cap of a smock or tower mill is turned. The centre part, like an octagonal smock mill, is covered with iron, and originally contained the millstones and machinery, but these have been removed. Beneath this is a six-sided brick building of two stories, which served the miller as a dwelling and store house. This has now been converted into tenements. The mill is now the property of the Wimbledon Conservators, who take good care of it. The sails, although they were shortened some years ago and the proper shutters removed, still revolve. The mill has just been painted, the woodwork white and the iron red.

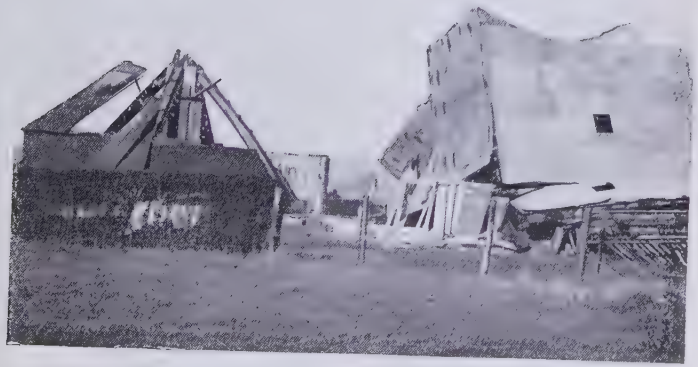
CHAPTER V

WINDMILLS IN SUSSEX

In the South of England the two counties which have the largest number of windmills are Sussex and Kent. In Sussex the history of windmills begins early. Seffrid II. was Bishop of Chichester between 1180 and 1204, and during that period he presented a windmill to the Church estates.

The next interesting reference occurs in May, 1264, when the Battle of Lewes was fought between Henry III. and his barons. Fighting with the King were his younger brother Richard, who styled himself "King of the Romans and always August," and Richard's son Edward. During the ensuing flight Richard and his son, being closely pursued and fearing that they would be unable to reach the priory for which they were making took shelter in a windmill. The mill was surrounded by the barons, but they failed to break in. The King of the Romans (always August!) and his son sheltered anxiously inside for half the day, but no help came, for Henry's army was in full retreat. As evening approached the barons declared that they would burn the mill unless Richard gave himself up. As there seemed

HALNAKER. [*Photo R. W. Bell.*



COLLAPSE OF DICKER MILL.

Blackboys Mill.

[*Photo H. Lloyd.*

[*Photo H. Lloyd.*

ARGOS HILL.

[*Photo R. Wailes.*

STAPLE CROSS.

[*Photo R. Wailes.*

NUTLEY MILL IN ASHDOWN FOREST.

[*Photo M. R. Packer.*

OLDLAND MILL, DITCHLING.

[*Photo H. Lloyd.*

to be no alternative Richard agreed to surrender on condition that it was to someone worthy of his high estate. It was to Gilbert de Clare, the commander of the opposing forces, that he yielded, and he was then led away in chains. This incident so pleased the barons and Henry's political enemies that it came to be made into a popular ballad.

Royal interest in the Sussex windmill did not end here, for when Edward I. went to review his fleet near Winchelsea in 1297 he rode along the bulwarks and came to a windmill. This he attempted to pass, but his horse took fright at the whirling sails and, in spite of Edward's endeavours to urge him past, leapt over the bulwark. As it was a big drop the other side the courtiers and people with the King were convinced he must be killed.

"But Divine providence so disposing, the horse fell upon his feet, even from such a height, into a road, which, from recent rains, was so softened with mud, into which the horse was able to slip for twelve feet, and yet did not fall; and being turned round by the King he ascended directly to the gate, through which he entered unhurt, and the people who were waiting for him were filled with wonder and delight at his miraculous escape." So writes Thomas of Walsingham, who relates the incident.

Richard Budgeon made the first large scale map of Sussex in 1724, and on this there are sixty-six

windmills marked.* They stood at Compton, Harting, Rook Binderts, *Halnecker, Wittering,* Birdham, Shripney, Slindon, two at Old Shoreham, Goreing, *Washington,* Beeding, *Henfield,* East Grinstead, *Chailey North Common, Southwick, Blatchington, Patcham,* five at Brighthelmston (Brighton), Falmer, Mount Harry, Hamsey, Kingston, *Lewes,* Peddinghoe, Dinton, Bedingham, Firle, *Ringmer, Argos Hill, Blackdown,* Rosehil[1] Laughton, Chalvington, *Windmill Hill,* Hooe Common, *Battle,* Hedgeland, West Field, Berwick, *Friston,* Jevington, three at *Eastbourne,* Hankham, *Bexhill,* St. Clement, Ore, Guestling, Brasses, *Northyham,* Bickley, Udimore, *Rye,* Hoad, Whittersham, *Barnham, Climping, Highdown,* Dunnington.

There are now the remains of sixty-nine windmills in Sussex, but only seven are working under sail, and most of the others are derelict.

Several tragedies have occurred among the windmills of this county recently. In December, 1929, what may have been the oldest mill in Sussex was blown down. This was Ashurst Mill, a post and open trestle, which had been in a very bad state for several years (page 88).

Another victim of the heavy gales of the winter of 1929-1930 was the post mill at Dicker (page 95).

* The names of places where mills are still standing are printed in italics.

This mill was in working order and doing a good trade.

Rye Mill, a fine smock which was owned by the Rye Corporation, caught fire and was completely burnt out in July, 1930 (page 121).

The only multi-sailed mill of which there is any definite record was built at Kingston, near Lewes. This was a post and round-house painted white, with six double-shuttered sweeps (page 117).

Alfriston (*page* 109) was once a fine stone tower mill. The tower itself still exists, but sadly mutilated. It is now part of a house, and a block of chimneys instead of sails rises above its flat roof.

Argos Hill (*page* 97), near Mayfield, is a post and round-house mill on a brick base. The fan attached to the tailpole was blown off in 1929. All the woodwork is painted white, and the mill stands on the top of a ridge of hills, making a beautiful landmark.

Arundel Mill stood on the banks of the Arun, a tower with four-shuttered sweeps and a fantail. All that remains now is the stump of the tower.

Ashurst Mill (*page* 88), north of Steyning, was blown down during the gales of December, 1929. It was a post and open trestle, and had not worked for many years. Its condition became steadily worse, and for three or four years before the final catastrophe it was amazing how it could resist the winds.

Although there is no record of when it was built, it was undoubtedly an old mill, and by some people considered to be the oldest in Sussex. Various attempts were made to buy it, but its owners refused to part with it. In their way they were very attached to it, but their attachment took the form of wanting to own it and allowing no strange hand to touch it. They knew it would blow over, but that did not matter. They would then also know exactly "what had happened to it." So the brambles grew all round the trestle, the steps, and the tailpole. A sweep fell off and the others were broken. The weather-boarding fell away, leaving the stones and machinery exposed. The mill made a gallant stand, but in the end the wind had its way.

Baldslow, about two miles north of Hastings on the road to Tenterden, has been an octagonal smock mill on a brick base with a stage. The cap has been removed and the three lower floors have been roofed over and converted into a house.

Barnham, between Bognor Regis and Arundel, is a tower mill worked by a gas engine. The four sweeps are still in position, though without shutters. The cap, sails, fantail, and stage are painted white. The mill was built in 1790.

Battle Mill is an octagonal smock on a brick base, which has been converted into a house. The fan has been removed, but the stocks of the four sails

CLAYTON MILLS.

[*Photo H. Lloyd.*

Bodle Street Green.

West Blatchington.

[*Photo A. J. Fellows.*

and the stage are still in position. The body of the mill is painted white, the cap black. About a mile out of Battle, close to the Hastings road, stands **Telham Mill.** This is a post and round-house mill, which has been converted into a tea-house. The sails have been removed.

Bexhill, Downs Mill, to the east of the town, is a post mill, painted white, on a two-storied brick round-house. It has four single-shuttered sails and a tailpole. It is in good condition and still working.

Blackboys Mill (*page* 96), ~~west~~ EAST of Uckfield, stands close to the Lewes—Mayfield road, behind the Blackboys Inn. It is a post mill, painted white, with four single-shuttered sweeps and a tailpole. The round-house is of tarred wood. This mill is still working and in fine condition. In December, 1929, one sweep was blown off, but was soon replaced.

Blackdown, near Hastings, has only the base of a smock mill left.

West Blatchington (*page* 104) is about two miles north of Brighton on the top of the Downs. The mill is surrounded by barns, above which it rises. The body of the mill stands on a square flint and brick base, three stories high, in the centre of the barns. A threshing machine stood in one of the barns and two chaff-cutters in another. These could be worked by the mill. In this way all the work on the cut corn was done in the one place.

This mill has not worked for some years, but the framework of two sweeps, the stocks of two others, and the fantail are still in position.

Being such a short distance from the sea, the mill naturally comes into the smuggling tales of the district. Tobacco and alcohol are said to have been hidden in it and regularly distributed to customers. It can be seen from the sea and is a well-known landmark to sailors.

Billingshurst Mill was blown down in 1906. The base of an octagonal smock still remains. Over the door is cut the date 1825.

Bodle Street Green (*page* 104), north of Hailsham, is a post and round-house mill which will probably soon be pulled down. It has been for sale for two or three years. The Society for the Protection of Ancient Buildings, hearing that it was to be pulled down and the timber sold, tried to raise enough money to buy and preserve it. They failed, and the mill is still for sale and threatened with demolition. It stands on a hill overlooking a pleasant countryside. The front of the mill is covered with sheeting, and it has four sails and a tailpole.

Broadoak, Rockhill Mill, close to the road between Heathfield and Burwash, is a post and round-house mill without sweeps. The mill body is covered with tarred sheeting, and the wooden round-house stands on small brick piers.

Chailey, North Common Mill, stands beside a big black yew tree, which is said to be the centre of Sussex. It is an octagonal smock mill, painted white, and standing on a brick base. About three years ago the cap was blown off, and it lies where it fell. All the machinery has been removed from the inside of the mill. It belongs to the Heritage Schools, and an unsuccessful appeal was issued for money to restore the cap. On the **South Common** there was also a smock mill. The base only of this remains, roofed over and used as a store.

West Chiltington, ~~west~~ EAST of Pulborough, is an octagonal smock mill on a two-storied brick base. The mill has been converted into a house. The framework of the four sweeps, the fantail, and the stage are in position.

Clayton Mills (*page* 103), on the Downs north of Brighton and close to the main road, are a very well-known pair, nicknamed Jack and Jill. Jack is a stone tower mill built in 1866. He stopped working in 1906. His sweeps and fan have gone, and he is now used as a house. Jill is a post mill, painted white, on a tarred wooden round-house. The framework of the sweeps is still up, but her life is now quietly passed as a garden shed. She originally stood in Brighton and was dragged up to the top of the Downs just before Jack was built. Beside these two is the round-house of another mill.

Clymping Mill (*page* 110), west of Littlehampton, is an octagonal smock which stood derelict for many years and was then converted into a house. Four new shuttered sweeps, rather shorter than the original ones, were then put up.

Cross-in-Hand (*page* 118) is a fine post and round-house mill which still works under sail. The mill body, four sweeps, ladder, and the fan on the tailpole are painted white. The round-house has two floors, the lower one of brick and the upper one of wood, painted white. The mill has three pairs of stones, and an engine is attached. The round-house of another mill is to be seen close by.

Crowborough has a post and round-house mill which is now used as a tea-house. The sweeps have been removed.

Dicker (*page* 95) is now no more, but it stood west of Hailsham, close to the Lewes—Hastings road. It was a fine post and round-house mill about one hundred and twenty-five years old, with four sweeps and a tailpole, and it could be seen working from the road. The unusually heavy gales of the winter of 1929-1930, which damaged so many Sussex mills, brought the career of this mill to an abrupt end. It was blown down one afternoon early in January.

Ditchling, Oldland Mill (*page* 98), is close to the road which runs from Hurstpierpoint to Lewes, under the north slope of the Downs. This mill is

ALFRISTON. [*Photo H. Lloyd.*

PUNNETT'S TOWN, BLACKDOWN MILL.

[*Photo H. Lloyd.*

CLYMPING.

[*Photo R. White.*

PUNNETT'S TOWN.

[*Photo H. Lloyd.*

POLEGATE.

[*Photo J. Holman.*

PATCHAM.

ST. LEONARDS, SILVERHILL MILL.

[*Photo E. Glover.*

EARNLEY.

[*Photo E. Glover.*

now owned by the Sussex Archæological Trust, which keeps it in good order. The ground floor is used as a museum for old Sussex agricultural implements. It is a post mill, painted white, with a brick round-house. The four-shuttered sails are in good condition but they no longer revolve, and the whole mill has been fixed so that it faces the Clayton Mills, which stand on the Downs above Ditchling. The age of this mill is unknown, but it is probably one of the oldest in Sussex. It has not worked since the Great War.

Earnley (*page* 112), near Selsey Bill, is an octagonal smock mill on a brick base with a stage. It has four sweeps, two shuttered and two common, and a fantail. This mill is still working.

Eastbourne, Hurst's Mill, north-east of the town, is a derelict tower without sails or fan. Another derelict tower stands at **Ocklynge.** The latter still has three dilapidated sails.

Friston, on the Downs beside the Eastbourne—Seaford road, was a post and round-house mill. It was blown down in 1926. All that remains is the flint round-house, in the centre of which stands the post with the crown-beam, gaunt and reminiscent of a gibbet.

Golden Cross has the round-house only of a post mill. It has been roofed over and is used as a store.

Hailsham Mill (*page* 88) is a derelict post and round-house. It stopped working over six years ago and since then the sails and nearly all the front of the mill have fallen. The round-house is of brick and has two floors. The four-shuttered sweeps had a span of over seventy feet.

Halnaker Mill (*page* 95), north-west of Chichester, is a derelict tower mill which was built about 1750. The cap has gone and the whole structure is in bad condition. It stands deserted and solitary on the top of the Downs.

Henfield, north of Steyning, is a derelict post and round-house mill. Three broken sweeps out of the original four are still in position.

Highdown Hill has only the brick base of a mill remaining.

There is also the tomb of a miller who died in the eighteenth century. John Oliver, miller of Highdown Hill, built his tomb and a summer house close to the mill in 1766, when he was fifty-seven years of age. On the tomb he had inscribed: "For the reception of John Oliver when deceased to the will of God: Granted by William Westbrook Richardson, Esq., 1766." He lived and worked in the mill for another twenty-seven years. When he died, in 1793, he was carried from his mill to his tomb, and a girl read the service and preached a homily from Micah vii, verses 5 to 9, in accordance with his will.

On a panel overlooking the sea is written: "In memory of John Oliver, miller, who departed this life the 22nd of April, 1793, aged 84 years."

In his will he left £20 a year to be spent on the upkeep of his tomb and summer house.

Hunston, south of Chichester, was a post and round-house mill built in 1720. All that remains is the brick base.

Icklesham, Hogg Mill, south of Winchelsea, is working. It is a tarred post mill on a brick base, and is one of the few post mills which have a fantail on the roof. This and the four single-shuttered sails are painted white. The mill is supposed to have stood originally on Pett Hill, some miles away, and to have been moved to Hogg Hill over a hundred years ago.

Jolesfield, south of Horsham, is a smock mill on a brick base. It is not working, but in good condition.

Kingston, Ashcombe Mill (*page* 117), two miles south of Lewes, no longer exists, but it must be included in any list of Sussex windmills. It is the only multi-sailed mill in Sussex of which anything definite is known. It is said that another one stood at Hastings, but no details exist. Ashcombe Mill was a post and round-house mill with six double-shuttered sweeps and a tailpole, the whole being painted white. It must have been a lovely sight

with its six white sweeps revolving on the top of the Downs. It was blown down in 1916.

Littlehampton Mill stands in the town, and there have been rumours that it is to be pulled down and a hotel built in its stead. It is a stone tower mill with four broken sweeps and a fan. This mill was painted by Constable.

Lewes, the round-house in Pipes Passage is the round-house of a post mill.

Behind the gaol there is also the base of the smock mill, which is now used as a garage. This smock mill existed before the gaol was built, and the miller had to raise his mill thirty feet, as the prison took his wind.

Marks Cross, near Dicker, was a tower mill. It was burnt out some years ago and a battlemented top has since been added. It is now used as a store.

Medmerry, near Selsey, is a derelict smock without sails or fan.

Netherfield, near Battle, is also a derelict smock without its sails.

Ninfield, between Battle and Bexhill, is a post mill with a two-storied brick round-house, and it has not worked for many years. The framework of two of the four sails remains.

Northiam, about halfway between Hastings and Tenterden, is a post and round-house mill. Two

Ashcombe Mill, Kingston.

[*Photo A. J. Fellows.*

CROSS-IN-HAND.

[*Photo H. Lloyd.*

broken single-shuttered sails are still in position. This mill was built about a hundred and thirty years ago from the remains of another post mill which stood in an adjoining field and was burnt. It stands on a hill above the village.

Nutbourne Mill, west of Chichester, is a derelict tower mill without sails or fan.

Nutley (*page* 98), in Ashdown Forest, is a post mill with an open trestle. It has not worked for some years, but is kept in fairly good condition. It has been underpinned in front with two brick piers, and a long pole also supports it. Of the sails little more than the four stocks remain. The mill was turned by means of a tailpole.

Nyetimber, west of Bognor, was a tower mill. Only the shell of the tower remains, and this has been roofed over and is used as a shed for storing timber.

Patcham Mill (*page* 111), on the Downs north of Brighton, built in 1885, was the last windmill built in Sussex. It is a four-storied tower mill with a round flat cap covered with sheeting. It has four double-shuttered sails and a fantail. The mill stopped working two or three years ago, but is still in good condition.

Peasmarsh, north of Rye, is an octagonal smock mill covered with sheeting and standing on a brick base. Some years ago the miller died and the mill

has not been touched since. The fan has fallen and the four-shuttered sails are getting very battered.

Playden Mill, near Rye, is a post mill with a brick round-house. It has four sweeps without shutters. This mill has not worked for many years, and stands in a private garden. In another garden close by the site of another post mill can still be traced.

Polegate Mill (*page* 111) is a brick tower with a stage, four sweeps, and a fantail. This mill can still be seen working from the Eastbourne Road.

Pound Hill, near Crawley, on the road to East Grinstead, is a smock mill on a brick base. The cap was blown off two years ago, and as the miller had insufficient money to repair it the mill has been left in this condition.

Punnett's Town, near Heathfield, had two windmills working under sail a little over a year ago. Both of them were octagonal smocks with a brick base, four sails, and fantail winding gear.

One of them, Blackdown Mill (page 109), is frequently mentioned by Kipling in his Sussex stories as the "Cherry Black Windmill." The other mill (page 110) was moved from Rye in 1862, and at Punnett's Town was used to drive circular saws. These two mills were dismantled in the autumn of 1929.

Ringmer, north of Lewes, has nothing left

Rye Mill Before the Fire.

[*Photo R. Wailes.*

Rye Mill After the Fire.

[*Photo M. R. Packer.*

SHELTER

Shipley Mill.

except the post of a mill, standing with its cross-bars on the ground. "L. K. 1700" is marked on the post in raised lettering.

Rottingdean Mill has been bought and is preserved by the parish. It is an octagonal smock on a brick base. The stocks of the four sails are in position.

Rye Mill (*page* 121), a fine smock on a brick base with a stage, four sweeps, and a fantail, was owned by the Rye Corporation. Some of the machinery had been removed, and the base was occupied by a baker. The future of this mill seemed assured, but on June 13, 1930, it was completely destroyed by fire. The brick base is now all that remains.

High Salvington, north-west of Worthing, beautifully situated on the Downs, is a post and round-house mill with four shuttered sweeps and a tailpole. The round-house is now used as a tea-room, and a small charge is made for admission to see the machinery, which is in good condition. One of the main beams inside the mill bears the seal of the Sun Insurance Company, dated 1774. The mill is supposed to have been working for at least fifty years before it was insured. It stopped work in 1897, and was sold on condition that it should be kept in the same state as it was in when the miller had ground his last sack of corn, ready to start work again in the morning.

Shipley Mill (*page* 122), south of Horsham, is a large octagonal smock five stories high. It has a brick base, a stage, four double-shuttered sails, and a fantail. The cap also is octagonal in shape, painted black, the rest of the mill being white. The mill was built in 1879 and was working until a year or two ago.

Sidley, Hoad's Mill, near Bexhill, is a post and round-house mill with four sweeps. It is in good working order.

Southwater, Cripplegate Mill, south of Horsham, has only the base of the smock left.

Southwick, between Brighton and Shoreham, has the base of an old mill and the millstones are to be seen near the Schooner Inn.

St. Leonards, Silverhill Mill (*page* 112), is a fine octagonal smock, painted white. It stands on a brick base and has a stage, four sails, and a fantail. It was built in 1865 on the site of another mill which was destroyed by fire. It is still working.

Staplecross (*page* 97), on the road from Hastings to Cranbrook, is an octagonal smock on a two-storied brick base. The mill is tarred and has a stage. It is no longer in use, and the fan and the sweeps have been dismantled. The stocks of the four sweeps remain.

Stone Cross, east of Polegate, is a tower mill working with two sails. The other two were blown down in 1928.

Warbleton, Summerhill Mill, is a derelict post mill with a brick round-house. The stocks of two sails are left. The ladder and tailpole are in fairly good condition, but the weather-boarding is falling off the mill.

Washington, west of Steyning, is a smock mill which has been turned into a house.

Windmill Hill, between Hailsham and Battle, is a derelict post mill, the sides covered with sheeting. The sweeps have gone, and the whole mill is in bad condition.

Winchelsea, St. Leonard's Mill, is a dilapidated post and round-house. The sails and the tailpole have gone.

East Wittering, south-west of Chichester, is a derelict smock mill without sails or fan.

EI TENHAM PUBLIC LI

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